

I claim:

1. In a method for producing a memory cell having a transistor and a capacitor in an integrated circuit, the improvement which comprises:

initially providing a whole-area polysilicon layer;

covering the polysilicon layer with an oxidation protection layer;

structuring the oxidation protection layer by photolithography to produce a mask covering a gate region and a field region of the transistor by etching the oxidation protection layer and uncovering the polysilicon in unmasked regions, causing the oxidation protection layer remaining over the field region to form a dielectric and the underlying polysilicon to form a first electrode of the capacitor;

converting the polysilicon of the polysilicon layer in regions freed from the oxidation protection layer into silicon dioxide by local oxidation;

applying a further polysilicon layer with an inclusion of a remaining oxidation protection layer;

applying and structuring a photoresist mask to cover a region of the further polysilicon layer disposed above the field region for forming a second electrode of the capacitor; and producing the second electrode of the capacitor by etching the further polysilicon layer in the unmasked regions.

2. The production method according to claim 1, which comprises removing the oxidation protection layer in regions not required for a remainder of the production process.

3. The production method according to claim 1, which comprises curving the oxidation protection layer upward at lateral ends.

4. The production method according to claim 1, which comprises carrying out the polysilicon conversion by thermal oxidation.

5. The production method according to claim 1, which comprises forming the oxidation protection layer of at least one nitride layer.

6. The production method according to claim 4, which comprises forming the nitride layer of oxide-nitride.

7. The production method according to claim 4, which comprises forming the nitride layer of an oxide-nitride sandwich.
8. The production method according to claim 4, which comprises forming the nitride layer of an oxide-nitride-oxide.
9. The production method according to claim 1, which comprises carrying out a source/drain implantation through the uncovered silicon before the removal of the ~~photomask~~ ^{photoresist mask} used during the photolithography, for producing a MOS transistor.
10. The production method according to claim 9, which comprises carrying out the conversion of the polysilicon into silicon dioxide in the source/drain regions as well as the field oxide regions.